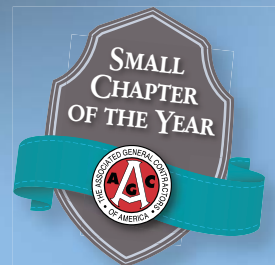


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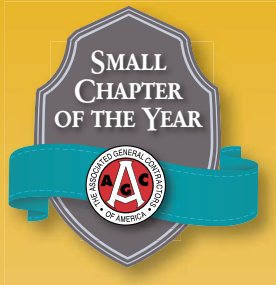
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Greener Built & Natural Environments

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by Melinda L. Tomaino
LEED® AP
Director of Green Construction,
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WE'VE ALL HEARD AND USED THE BUZZ WORDS "GREEN" AND "SUSTAINABLE." ORIGINALLY, ONLY A CHAMPION OF THESE WOULD ACTUALLY PAY TO IMPLEMENT THEM INTO THEIR PROJECTS. TODAY, IT'S NOT JUST THE ENVIRONMENTALISTS BUYING INTO THE IDEA: THE MASSES ARE CONFORMING TO THIS NEW STANDARD.

The "green" ideals are being written into construction codes and becoming the enforceable standard. What does that mean? It means it's time to push the envelope again. Read on to learn more about what's happening now and how to keep all the new certifications and standards straight.



Building Programs

Green buildings have matured and grown in the last 15 years to such an extent that the basic principles need little introduction to many in the building professions. In a nutshell, green buildings aim to: (1) maximize the efficiencies of how a building uses water, raw materials and energy resources; and (2) enhance the well-being of the building's occupants often through the materials used

in the interior spaces or by providing a connection to nature, daylight, and community amenities. For most construction professionals (unless you assist with the siting and design), the green building process adds a layer of detail to the tasks of sourcing and installing specified materials and systems, completing chains of custody and other documentation, taking precautions onsite, as well as training and managing the workers and subcontractors in the field.

Shift from Voluntary to Mandatory Green Building

The growth of the green building market was driven mainly by the voluntary use of rating systems and standards by building owners; however, governments at the federal, state and local levels have encouraged its growth. In the past, some governmental entities would develop their own programs or encourage the use of green building rating sys-

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tems. More recently, some have gone so far as to mandate the use of a particular rating system (in full or in part) for public and/or private buildings. The shift from voluntary to mandatory seems to be gaining momentum as governments can now use model code language to quickly and easily adopt green building principles as a threshold for any new buildings within their jurisdiction.

In the last few years, two prominent organizations have developed “code-friendly” standards and model-code language that jurisdictions can adopt. ASHRAE, with industry partners, released Standard 189.1 for high-performance buildings; and the International Code Council released the International Green Construction Code (IgCC) to provide model code language. The two were not in conflict and, in fact, Standard 189.1 is an approved alternative compliance path for the IgCC. Both also aligned well with the popular Leadership in Energy and Environmental Design (LEED) green building rating system. However, the partnership announced in 2014 they further aligned the two programs giving governmental entities a solid path forward with green building code adoption. Standard 189.1 and the IgCC will merge, and the new “189” will then integrate with LEED. Eventually, meeting 189 on a project would align that project with LEED prerequisites and streamline LEED certification. Participating groups are the International Code Council (ICC), ASHRAE, the American Institute of Architects (AIA), the Illuminating Engineering Society of North America (IES) and the U.S. Green Building Council (USGBC).

When studying Standard 189.1 and/or the IgCC, building professionals should keep in mind that there will still be some variation as jurisdictions tailor their green building code adoption to emphasize local and regional priorities. In addition, adoption will be staggered as jurisdictions update their programs. Jurisdictions also may choose a different route or choose to not address green building at all. Changing the building code is a long, arduous and highly localized effort with opportunity for public discussion, and, if a green building code is adopted, then many building professionals (including design professionals, contractors and code inspectors) will

need to be trained on the new requirements.

Reaching Beyond the Green Codes

Now that building codes are going green, one may ask whether there's still a place for green building certification programs. Many organizations have released programs in the last decade that push the market ever greener. These programs also offer value in reaching beyond the green codes and continuing to improve the sustainability of buildings, such as achieving net zero energy buildings. As green building codes are more widely adopted, building professionals can expect these voluntary programs to push the bar up even higher in order to remain relevant in the market.

AGC has provided below a brief introduction to some of the popular green building programs, as well as new and developing programs:

- **Green Garage Certification** - The Green Parking Council (GPC) launched a program in 2014, Green Garage Certification, to define and recognize sustainable practices in parking structure management, programming, design, and technology. Built through the collaboration of over 200 professionals from the parking, real estate, technology and sustainability worlds, Green Garage Certification promotes a holistic approach to garage performance and sustainability and encourages the adoption of emerging smart parking and intelligent transportation tools. In late 2014, the GPC and the International Parking Council signed a memorandum of understanding with the Green Business Certification Institute (GBCI), the certification body for LEED. (Note: GBCI was renamed in April 2015 from the Green Building Certification Institute to reflect the changing nature of the certification and credentialing programs they manage.) www.greenparkingcouncil.org
- **Green Globes** - The Green Building Initiative (GBI) makes available green building standards and rating systems for new buildings, existing buildings and interiors of commercial and institutional buildings through Green Globes. GBI also maintains a credentialing program for professionals. Two

unique features of Green Globes is its online assessment tool that offers tips for further “greening” a project as well as a site visit as part of the certification process. In addition, GBI used the ANSI standards development process to release a version of Green Globes program as ANSI/GBI 01-2010: Green Building Assessment Protocol for Commercial Buildings. GBI is currently updating the standard through the ANSI Periodic Maintenance process, which they expect to complete this year. www.the-gbi.org

- **Living Building Challenge** - In 2014, the International Living Future Institute released v3 of its Living Building Challenge. A building certification program, the Living Building Challenge is comprised of seven performance categories called Petals: Place, Water, Energy, Health & Happiness, Materials, Equity and Beauty. The Institute uses the Living Building Challenge as a framework for its Net Zero Energy (NZE) Building Certification program, the only program in the U.S. currently to certify NZE building performance. www.living-future.org
- **Leadership in Energy and Environmental Design (LEED)** - The most well-known of green building programs, the LEED platform has evolved to cover new construction, interiors, operations and maintenance of existing buildings, neighborhood development, and homes. Developed by the U.S. Green Building Council (USGBC); the GBCI certifies buildings and administers the LEED credentialing program. “More than 60,000 projects are participating in LEED across 150+ countries and territories, comprising over 11 billion square feet,” according to the USGBC. The newest version of LEED, v4, is available for use; however, project teams can continue to register projects under the popular LEED 2009 version until Oct. 31, 2016. www.usgbc.org
- **National Performance Based Design Guide** - In 2014, the National Institute of Building Sciences published the National Performance

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standard for use by facility owners and building industry professionals. The NPBDG is based on the updated U.S. General Services Administration P-100: Facilities Standards for the Public Buildings Service. The NPBDG uses four levels of performance defined in matrices, baseline performance and Tiers 1-3 of high performance. www.nibs.org

• **WELL Building Standard** - The International Well Building Institute (IWBI) launched the WELL Building Standard® in late 2014. The WELL Building Standard® can be applied to commercial, institutional, and residential developments including new construction, core and shell, and tenant improvements. The WELL Building Standard® sets performance requirements in seven categories: air, water, nourishment, light, fitness, comfort, and mind. On-site post-occupancy performance assessments that include air and water testing are required for certification. The WELL Building Standard® is certified by GBCI, the same organization that provides certification for LEED. www.wellbuildinginstitute.com

comply with multiple environmental requirements such as stormwater runoff and erosion controls, wetlands mitigation, and endangered species protection. And since the nature of a road is to connect us to each other and the places we want to go, sometimes avoiding environmentally sensitive areas is not possible. Additional protections in these areas may be necessary but the value of accessing sites of, for example, historic or natural interest cannot be underestimated. In the case of a publicly-funded construction project, administrative environmental review processes also come into play, such as the National Environmental Policy Act and its state equivalents. Therefore, a large portion of the approval process, aside from funding, is devoted to environmental reviews and permitting.

With comprehensive and well-established environmental protection in place – as well as an excellent record of using recycled materials and reusing industrial materials in roadways – where did the drive towards “green” roads originate? And what is a green road?

Origins of Green Roads

Unlike green buildings, where the adoption was primarily market-driven with government support, green roads initiatives originated at the federal and state government levels. The motivation behind these initiatives appears to be two-fold: (1) a means to share best practices and (2) a better way to communicate the environmental protections and benefits of a road with the public and policy makers. Official environmental assessments can run hundreds to even thousands of pages including multiple studies and do not make the best talking points.

The science and technology behind (or underneath) a roadway is a complicated and evolving field of study, and environmental best practices have emerged through years of research and careful application. Such practices are being shared through national organizations such as the Transportation Research Board of the National Academies, which has a searchable collection of environmental research and best practices information. Programs such as the Green Highways Partnership, begun by the Federal Highway Administration (FHWA) and the U.S. Environmental Protection Agency in 2005, also originated as a way

to foster those types of communications on environmental and sustainability developments.

It was in part these national discussions that led to FHWA's development of the INVEST program launched in 2012. The Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) “is a practical, web-based collection of best practices,” according to the FHWA. INVEST is a voluntary self-assessment and programmatic tool that helps transportation agencies identify sustainable attributes and incorporate best practices into their programs and projects. INVEST provides guidance and parameters for the planning, development and maintenance stages of programs and projects. Several state programs have also played a role in improving and communicating best practices. Whether it is Illinois' Livable and Sustainable Transportation program, New York's Green and Blue Highways program or the Greenroads assessment from Washington, state programs have helped communicate the protections and benefits of a roadway to the surrounding communities.

What Is a Green Road?

We will use the Greenroads program as an illustration of the types of sustainability issues that can be addressed. Greenroads is intended to be used on a specific roadway project (it is not a programmatic tool). In addition, the Greenroads tool is gaining acceptance outside of its originating state of Washington; therefore, it is possible that road builders in other states will encounter the program.

Greenroads has its development roots at the University of Washington and is currently managed by the Greenroads Foundation, a non-profit that reviews and certifies roadway (and bridge) projects and offers credentialing for Sustainable Transportation Professionals (STP). The certification program is set up similar to the Leadership in Energy and Environmental Design (LEED) for green buildings. Projects have a list of prerequisites that they must obtain and then a series of optional credits grouped in associated categories. A project can be certified to one of four levels based on the score they obtain: certified, silver, gold and evergreen.

The Greenroads categories are as follows: project requirements, environ-

continued on page 10

2 Highways & Roads

Highway and road projects are vital to our communities, and a well-maintained road can reduce pollution (from congestion) and improve the safety of its travelers. But anyone involved in the process of building a new road or maintaining an existing one knows just how long it takes to gain the necessary approvals. A part of that approval process is related to environmental protection.

Existing Environmental Requirements

A roadway can stretch many linear miles through varying terrain and habitats, and the project will likely need to

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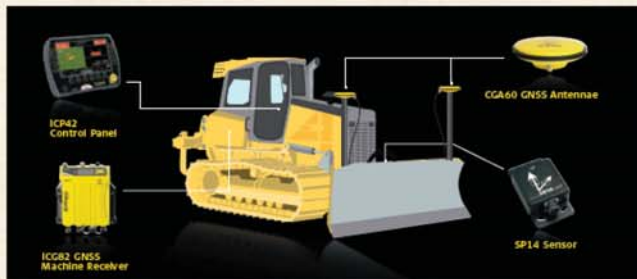
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Greener Environment

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ment and water, access and equity, construction activities, materials and resources, and pavement technologies. Greenroads also offers two customizable, voluntary credits. Below is a selection of prerequisites and credits to provide insight into the types of sustainability issues addressed by the program (not a complete list).

- Context Sensitive Solutions
- Contractor Warranty
- Ecological Connectivity
- Equipment Emissions Reduction
- Environmental Management System (ISO 14001 certification for general contractor)
- Habitat Restoration
- Light Pollution
- Low Impact Development (LID)
- Noise Mitigation Plan
- Permeable Pavement
- Recycled Materials
- Regional Materials
- Site Recycling Plan
- Site Vegetation
- Stormwater Runoff Controls
- Warm Mix Asphalt (WMA)
- Waste Management Plan (construction and demolition)

For a complete listing of prerequisites and credits as well as additional information on the rating system, visit www.greenroads.org.



An investment in communities and their sustaining infrastructure is an investment in the future, and that includes protecting our water and land resources to make our communities greener—and safer. Our nation's drinking water and wastewater infrastructure are in critical need of attention. Leaking pipes alone are responsible for billions of gallons of lost water every day and, in many parts of the country, wet weather events regularly lead to overflowing systems that release waste and chemicals into the environment—damaging aquatic ecosystems and causing human illness. In addition, our nation's dams, levees and pumping stations are an important source of energy generation, water storage for drinking and irrigation, and flood control; yet they

are increasingly unsafe and unreliable.

Notwithstanding the current political focus on adapting communities to withstand extreme weather patterns—from droughts to monsoons, blizzards to heat waves—as well as severe storms, the maintenance and improvement of these infrastructure are critical to sustaining our communities and building a green future.

Drawing on the interest in green buildings, programs are now available to address challenges specific to infrastructure and public works. These green infrastructure programs have found new partners in the green community to further galvanize efforts to improve our nation's infrastructure. Below AGC explores two green infrastructure programs: Envision and Sustainable SITES.

Envision Sustainable Infrastructure Rating System

Envision™ is an emerging sustainability infrastructure rating system and planning tool released by the Institute for Sustainable Infrastructure (ISI). According to ISI, Envision “can be applied to all civil infrastructure other than buildings and can be used to assess the sustainability of an infrastructure project at any point in its life cycle—from inception on.” Envision is also a programmatic planning tool that helps communities identify their sustainable infrastructure needs and evaluate how projects are delivered and how long they are intended to last.

Envision provides sustainability criteria in five main categories: quality of life, leadership, resource allocation, natural world, and climate and risk. The criteria give guidance on sustainability concerns such as biodiversity, emissions, energy, materials, resilience, siting, and water to name a few.

According to ISI, Envision can be applied to the following types of projects:

- Airports and Hangars
- Bridges and Interchanges
- Fiber-optic Communication Installations
- Mining, Cement, Chemical and Manufacturing
- Power Plants
- Rail Facilities
- Roads and Highways
- Sanitary Sewer Systems
- Underground Utilities
- Water Transmission and Distribution Lines
- Water Treatment Plants

- Water Treatment Projects

Projects can be certified bronze, silver, gold or platinum. ISI also provides a training and credentialing program for individuals using Envision. ISI was founded by the American Society of Civil Engineers, the American Public Works Association and the American Council of Engineering Companies. www.sustainableinfrastructure.org

Sustainable SITES

The SITES™ v2 rating system has been released by the Sustainable Sites Initiative™ for use by landscape architects, designers, engineers, architects, developers, policymakers and others who work in land design and development. SITES is applicable to public or private open spaces from streetscapes and plazas, national and city parks to public and private campuses, landscape projects at corporate headquarters, and residential neighborhoods or private homes.

The SITES v2 rating system and an accompanying reference guide provide a set of best practices, performance benchmarks and tools for creating and evaluating sustainable landscapes. Landscapes are considered sustainable if they reduce water demand, filter and reduce stormwater runoff, provide wildlife habitat, reduce energy consumption, improve air quality, improve human health, and increase outdoor recreation opportunities. Several of the SITES credits align with the sustainable sites credits in U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) green building rating system to streamline dual certifications.

AGC Arkansas would like to know what projects you're working on and what you're doing to stay sustainable. Email btlyer@agcar.net with your recent projects. And, follow the conversation on Twitter through @AGCEnvironment to learn what your colleagues around the country are doing. ■

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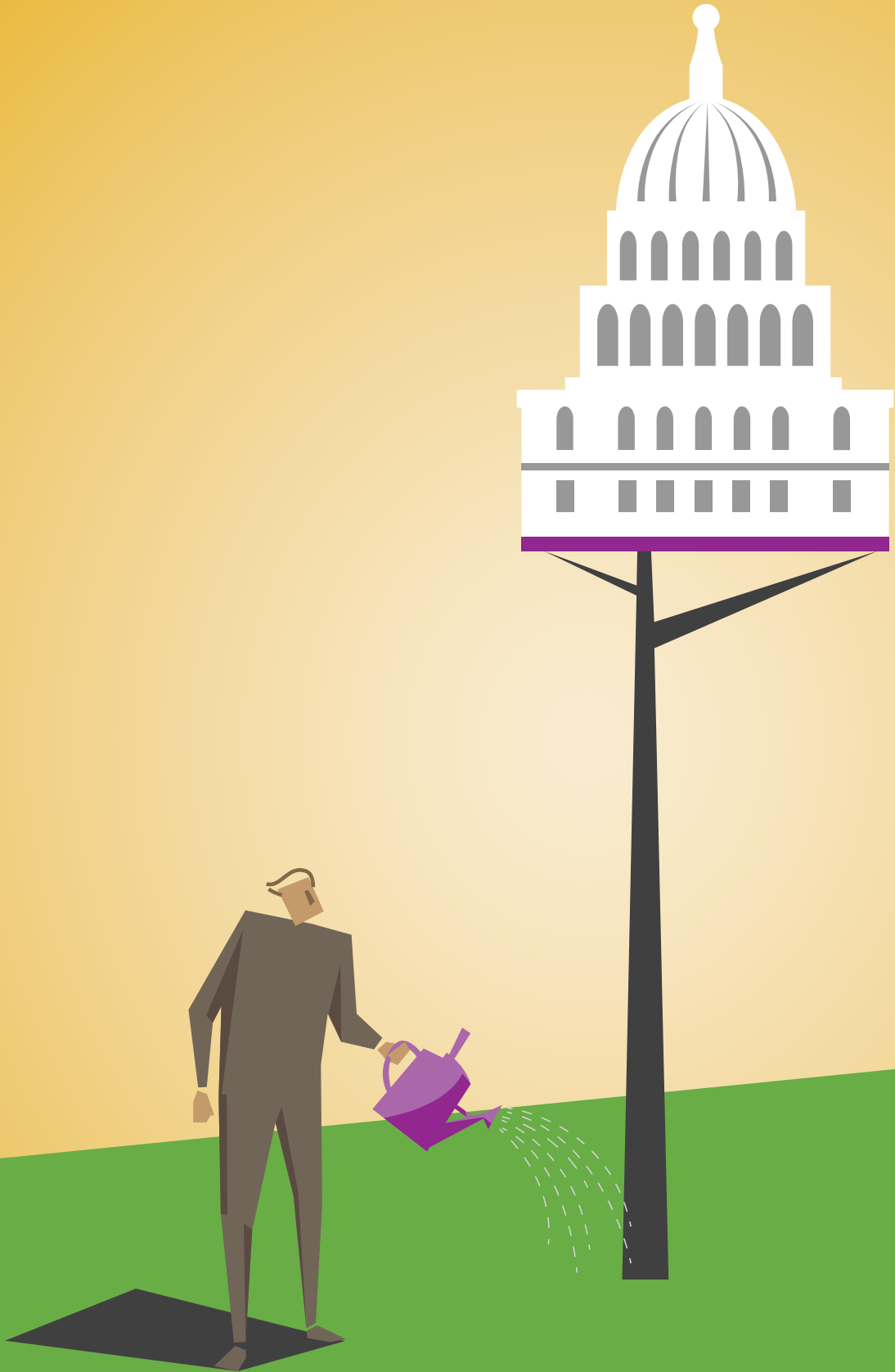
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Advancing Sustainability *at the Federal Level*

13

*by Alexandra Oster
Community Planner
Volpe: The National
Transportation Systems Center,
U.S. Department
of Transportation*

IN THE TRANSPORTATION INDUSTRY, PROJECTS AND SYSTEMS SERVE MANY DIFFERENT AND SOMETIMES COMPETING ROLES, IN ORDER TO ACHIEVE VARYING OBJECTIVES, INCLUDING SAFETY, MOBILITY, ENVIRONMENTAL PROTECTION, LIVABILITY, AND ASSET MANAGEMENT.

A sustainable approach seeks to meet all of these needs while working to achieve economic targets for cost-effectiveness throughout a highway's life cycle. For the Federal Highway Administration (FHWA), a sustainable approach to highways means decision makers are able to make balanced and efficient choices among environmental, economic, and social values—the triple bottom line of sustainability—that will provide the best benefits to the natural and human environment now and in the future. A sustainable approach includes a wide variety of activities and a diversity of concepts that support the triple bottom line principles. These include efficient use of funding, incentives for construction quality, climate change considerations, and civil rights.

To illustrate how sustainability has

been incorporated into a wide variety of FHWA programs, projects, policies, processes, and partnerships, FHWA released *Advancing a Sustainable Highway System: Highlights of FHWA Sustainability Activities* (www.sustainablehighways.dot.gov) in June 2014. Developed with input from an internal Sustainability Working Group, it showcases several of the agency's long-standing, well-established programs, as well as highlights work that represents opportunities for new growth and advancement with high potential for achieving sustainability goals and benefits. Activities featured in the report range from projects to mitigate climate change impacts, to initiatives that promote safety and sustainable pavements, to tools to better assess the benefits and costs of transportation investments. The report serves as a re-

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Advancing Sustainability

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source to the public, transportation professionals, and those working within FHWA to help them learn about and understand the various sustainability activities and initiatives moving forward within the agency.

FHWA hopes that the sustainability report will better inform readers about the breadth and depth of FHWA sustainability activities, spur greater application and implementation of sustainability practices at all levels of government, and encourage greater collaboration and communication within the agency and with leaders in the field to continue to advance a more sustainable highway system.

Background on Sustainable Highways

Sustainability is often described using the “triple bottom line” concept, which includes giving consideration to principles in three primary areas: Social Equity, Environment, and Economics. Sustainability aims to satisfy basic social and economic needs, both present and future, by promoting the responsible use of natural resources, while maintaining or improving the environment on which life depends. FHWA is committed to improving the social, economic, and environmental outcomes of its activities. FHWA works hand-in-hand with stakeholders nationwide to demonstrate the benefits derived from sustainability and stewardship opportunities including expedited program delivery, accelerated transportation decision making, and im-



Warm-mix asphalt pavement construction is an example of a technology that can increase the sustainability of pavement systems.

proved environmental streamlining.

For years, FHWA has supported research and development and implementation efforts at the forefront of the sustainability movement. In the Office of Natural Environment, the Sustainable Highways Initiative supports programs and activities conducted across FHWA to facilitate balanced decision making among the “triple bottom line of sustainability.” The Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) and the creation of a Sustainable Pavements Program in the Office of Infrastructure are a couple of examples of efforts underway at FHWA to help State and local agencies strengthen the sustainability of the Nation’s roadways.

Infrastructure Voluntary Evaluation Sustainability Tool

Launched in October 2012, FHWA developed INVEST (www.sustainablehighways.org) as a practical, web-based collection of best practices to help transportation agencies integrate sustainability into their programs and projects. Agencies, such as State Departments of Transportation (DOTs), Metropolitan Planning Organizations, Councils of Government, public works departments, and their consultants and partners, can voluntarily use INVEST to evaluate the sustainability of their programs and projects. This FREE tool is intended to identify and recognize efforts that go above and beyond standard practice toward the goal of sustainability. FHWA is currently partnering with transportation agencies to implement INVEST, develop case studies based on lessons learned, and gather feedback on ways to enhance and improve the tool for future use.

How is INVEST Structured?

INVEST allows users to evaluate the transportation life cycle using the system’s three modules: System Planning, Project Development, and Operations and Maintenance. Each module is based on a specific set of criteria and can be used separately. System Planning evaluates the sustainability of system-level planning and programming policies, processes, procedures, and practices. Project Development incorporates sustainability into project plan-

Sustainability Action Areas

Advancing a Sustainable Highway System: Highlights of FHWA Sustainability Activities showcases eight “Action Areas” developed in consultation and collaboration with the FHWA Sustainability Working Group. The Action Areas represent significant opportunities for new growth and advancement in sustainability for FHWA, and have high potential for achieving sustainability goals and benefits in the near term. The Action Areas are:

- Safety
- Access and Affordability
- Freight and Goods Movement
- Linking Asset Management and Planning
- Infrastructure Resiliency
- Economic and Life Cycle Cost Analyses
- Sustainable Pavements
- Road Weather Management

ning, from design to construction. And Operations and Maintenance focuses on integrating sustainability into system-level operations and maintenance activities. Within each of the modules, the decision of when to evaluate a program or project is up to the user. Typically, the earlier in the development of a program or project a self-evaluation is performed, the more ability the user has to positively influence sustainability.

How Does Scoring Work?

After users select a module they begin scoring a project or program based on the criteria in that module. Each INVEST criterion describes a particular sustainability best practice and assigns it a point value according to its relative impact on transportation sustainability. The points associated with each criterion are then added together to give a total score.

How Does INVEST Address Construction?

INVEST provides several criteria that can help transportation professionals integrate sustainability into the construction of a particular transportation

project. For example, as part of the Project Development Module, numerous criteria could apply to the development and construction of a roadway or bridge project. Certain criteria focus on reducing the life-cycle costs of projects through reducing, reusing, and recycling materials and designing long-lasting pavement structures. Other relevant criteria address the impacts of construction activities to the surrounding neighborhoods and environments, such as Construction Environmental Training and Construction Noise Mitigation.

INVEST in Action

The Ohio Department of Transportation (ODOT) is currently using INVEST to improve the sustainability for its project to replace the Innerbelt Bridge in Cleveland with the George V. Voinovich Bridge. ODOT wove the principles of INVEST into its contract procurement process for this project. ODOT required that contractors use INVEST in their project proposals to demonstrate sustainability achievements and asked that contractors state how many INVEST points they could deliver. After the contract was

awarded, ODOT staff, FHWA staff, and contractor staff met for an eco-charrette that used the INVEST framework to discuss how to implement sustainable practices.

As of summer 2014, the project has saved more than 100,000 gallons of diesel fuel, recycled 5.7 million pounds of steel, saved 22 million gallons of water, and prevented more than 125,000 cubic yards of waste from entering landfills. The project achieved an overall Gold-level status, the second-highest INVEST status level, for the westbound bridge, which was completed in November 2013*. ODOT is striving for platinum status, the highest status level, for the eastbound bridge, which is expected to be completed during fall 2016.

INVEST Across America

Thus far, 31 agencies, spread across Federal, State, and local levels, have used or are currently using INVEST. These agencies represent nearly 60 separate INVEST implementation projects in 26 States and the District of Columbia.

continued on page 16



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**Because INVEST is not based on third-party validation of scores or certifications, scores are not considered recognition*

by FHWA that a program has met the achievement level of sustainability. Rather, it is recognition that the user has self-evaluated their program and met the indicated achievement level.

Sustainable Pavements Program

Design, construction, and maintenance of highway pavements can create a wide assortment of environmental impacts related to water quality and supply, stormwater management, air quality, and heat absorption. To better address these potentially adverse environmental impacts and employ more sustainable materials and techniques, FHWA created the Sustainable Pavements Program (www.fhwa.dot.gov/pavement/sustainability) in 2010. This program aims to increase the body of knowledge regarding sustainability of asphalt and concrete materials in pavement design, construction, and maintenance and to increase

the use of sustainable technologies and practices related to pavements.

What is a Sustainable Pavement?

A sustainable pavement is one that achieves its specific engineering goals while meeting basic human needs; using resources efficiently; and preserving or restoring surrounding ecosystems. For FHWA, a sustainable approach to pavements means that decision makers make balanced and efficient choices among environmental, economic, and social values—the triple bottom line of sustainability—that will provide the best benefits to the natural and human environments now and into the future.

Sustainable Pavement Technical Working Group (SPTWG)

The SPTWG brings together stakeholders from the U.S. Department of Transportation (DOT), State DOTs, local governments, the pavement industry, and academia. The SPTWG, which meets twice a year, provides technical input to FHWA program managers on sustainability practices related to pavement systems and materials. It also provides a forum for experts from different parts of

the pavement community to share information on emerging best practices.

Technology Transfer

Technological advances in pavement sustainability do not instantly make it into the toolboxes of practitioners. The Sustainable Pavements Program uses technical briefs (TechBriefs) and webinars to educate engineers about current best practices in pavement sustainability. The Sustainable Pavements Program has published two TechBriefs, an introduction to pavement sustainability and a guide to life cycle assessments of pavement systems. Both TechBriefs are designed for pavement professionals who may not have a background in environmental analysis.

Reference Document

As sustainable pavement grows more popular, professionals need up-to-date technical information and guidance on best practices. Recognizing that existing reference materials were outdated or limited in scope, the FHWA Sustainable Pavements Program prepared a comprehensive reference document that provides the latest knowledge and information for designing, constructing, and maintaining sustainable pavement structures.

Released in March 2015, *Towards Sustainable Pavement Systems: A Reference Document* (www.fhwa.dot.gov/pavement/sustainability/ref_doc.cf) covers the entire pavement life cycle—from initial materials processing to end-of-life considerations. It also contains key information on pavement sustainability concepts, pavement sustainability and livable communities, and methods for assessing pavement sustainability.

The reference document is designed to help practitioners navigate the subject of sustainability while developing mixture designs, pavement structure designs, and construction, preservation, and maintenance techniques. It also contains relevant information for other pavement stakeholders, including those in private industry, academia, and all levels of government.

The focus of the reference document is on proven techniques and technologies that engineers can implement today. FHWA plans to update the document as new technologies develop and new best practices emerge.



The Sustainability Triple Bottom Line



INVEST is composed of three modules, System Planning, Project Development, and Operations and Maintenance (OM) that are based on separate collections of criteria.

What's Ahead?

FHWA will continue to advance efforts related to sustainability through the Sustainable Highways Initiative, INVEST, the Sustainable Pavements Program, and the practices of its program offices. FHWA will also continue to engage its internal Sustainability Working Group to further sustainability goals and plans for the agency, recommend and assist with outreach efforts, and provide input on research activities. FHWA recently announced a new webinar series *Advancing a Sustainable Highway System: High-*

lights of FHWA Sustainability Activities. Each webinar will focus on a particular section of the report and will feature specific FHWA activities that advance sustainability. The first three webinars will focus on:

- Access and Affordability
- Linking Planning and Asset Management
- Sustainable Pavements

This series is geared towards both internal and external stakeholders at the Federal, State, and local levels. (www.sustainablehighways.dot.gov/FHWA_Sustainability_Activities_Webinars.aspx) ■

FHWA Infrastructure Carbon Estimator

FHWA has developed several publications and tools in the last year to advance climate change mitigation efforts, including the *Infrastructure Carbon Estimator*. This spreadsheet tool estimates the lifecycle energy and greenhouse gas emissions from the construction and maintenance of transportation facilities. The Estimator requires limited data inputs and is designed to inform planning and pre-engineering analysis. The tool is based on a nationwide database of construction bid documents, data collected from State DOTs, and consultation with transportation engineers and lifecycle analysis experts.

17

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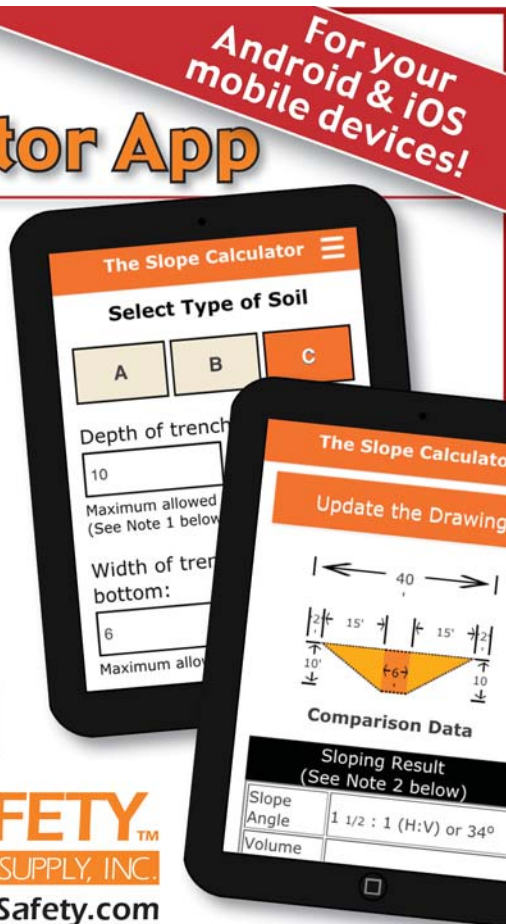
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JBU Shelter
during the wind
test against
"The Wolf" at 110
MPH wind.



Testing Timely Ideas

19

at the John Brown University Disaster Shelter Design Competition

*by Mark Terrill
Assistant Professor,
John Brown University*

IN APRIL 2015, SAMARITAN'S PURSE SPONSORED JOHN BROWN UNIVERSITY CONSTRUCTION MANAGEMENT DEPARTMENT'S 4TH ANNUAL DISASTER SHELTER DESIGN COMPETITION.

The competition is an opportunity for undergraduate Construction Management, Engineering, and Architecture students to put their knowledge and skills to use in developing a prototype shelter that could be used to respond to various types of disasters throughout the world. Students are given a disaster scenario along with design criteria, and then are asked to design and build a prototype shelter they think would best fit response to the disaster scenario. The prototypes are then brought to John Brown University where they are evaluated against design criteria by a team of judges and are put through several tests to verify their compliance.

This year, student teams were asked to design a disaster shelter that would best respond to an earthquake disaster in Pakistan. Design criteria included:

- Floor area of 14 square meters
- Assembly time of less than 2 hours
- Weight of no more than 200 kg
- Cost under \$1500 per shelter
- The ability to withstand seismic activity equivalent to approximately 5 on the Richter Scale, wind loads of at least 50 mph, and thermal retention considering temperature swings of at least 40 degrees F.

Other less objective considerations included cultural appropriateness, expandability, ease of assembly, and ease of packing and shipping. In order for teams to develop their prototype, they had to research the location, local culture, type of disaster, local materials, and also consider the needs of disaster response organizations who might need to use their shelter.

Five teams competed this year -
continued on page 20



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Timely Ideas

from page 19

Dordt University from Iowa, Temple University from Pennsylvania, Pitt State from Kansas, an exchange team from South Korea (attending Pitt State), and John Brown University. Each team spent several months doing research, design, and construction of their proto-type as well as providing a project summary report and business case analysis in advance of the competition for review by the competition judges. During three days at the competition site in Siloam Springs, Ark., the teams did a formal presentation to the competition judges and the shelters were put through a series of practical tests including:

- Seismic capability was tested using a shake table built by JBU CM and powered by a John Deere Front End Loader
- Heat retention capability was tested in an insulated booth utilizing liquid nitrogen to cool the interior of the booth
- Wind resistance was tested using equipment from Intertek ("the Wolf").
- Weight of the shelter
- Amount of time to assemble the shelter

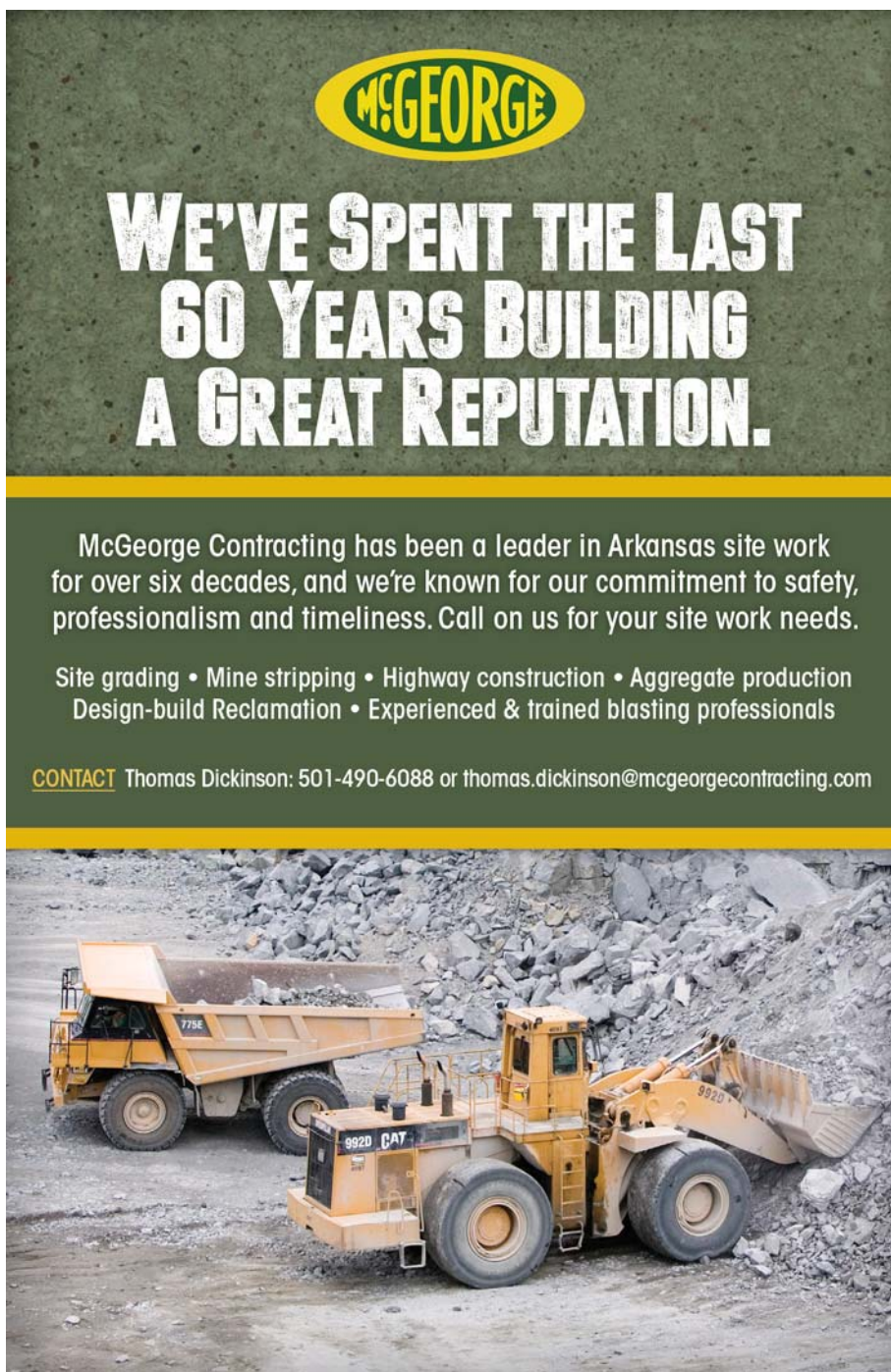
The six competition judges had experience in disaster response as well as engineering and construction in the developing world. Judges were from Samaritan's Purse, Engineering Ministries International, Judson University, Missionary Tech Team, World Housing Solutions, and Clark Contractors (one of our local AGC Members). The judge from Clark Contractors was Danny Bennett, who did volunteer relief work in Pakistan after an earthquake in 2005, which was the exact scenario chosen for this year's competition.

Overall scores were very close, but when the dust settled, the 2015 competition winner was Dordt University, with JBU placing second, and the Pitt State team from South Korea placing third. In the next few weeks, JBU and Samaritan's Purse will discuss sponsorship and parameters for a 2016 competition. If you are interested in sponsoring or judging next year's competition, please contact Assistant Professor Mark Terrill at MTerrill@jbu.edu. ■



Watch video highlights of the competition:

www.jbu.edu/shelter_contest



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Word from the Top

22

by Mike Hocutt
AGC Arkansas President



AGC Gets Proactive

As this legislative session drew to a close, we were able to look back on our accomplishments with a strong measure of pride. We took the offensive on several measures and saw those eventually signed into law while also taking part in the passage or defeat of the usual number of bills impacting the construction industry.

Of course, we were disappointed to once again suffer a setback in our attempts to find more state-level funding for our highway program. This continues to be frustrating as we watch legislators on the federal AND state levels continue to ignore the declining quality of our roadways with no one putting forward any sort of plan to solve what is about to be a major crisis. In the last few years we have now seen more than a dozen states increase taxes (usually gasoline) in order to fund road maintenance and expansion.

We can't afford to keep ignoring this at either level and are encouraged by formation of the Governor's new working group to look at how we fund our transportation system. This citizen/legislator task force, including AGC appointee Scott McGeorge, will be charged with developing possible funding solutions and will work toward building a consensus in the legislature that is also palatable to the citizens of Arkansas. It will be a monumental task but Arkansans have proved in the recent past that they understand the importance of infrastructure investments and we are confident they will embrace such investments again.

Rep. Reggie Murdock and Sen. Jason Rapert led the charge for us by championing several bills that will enhance building construction for both general and subcontractors. Though our cleanup bill addressing construction

Bills Sponsored by AGC:

HB 1008 (Murdock) – An Act to Regulate the Fairness in the Bidding Practices for the Construction of Publicly Funded Projects; to Modify the Retainage Laws of the State of Arkansas; and for Other Purposes. **SUPPORT** HB 1008 is now Act 866.

SB 488 (Rapert) – An Act to Prohibit Enforcement of Certain Provisions in Construction Agreements and Construction Contracts; and for Other Purposes. **SUPPORT** SB 488 is now Act 1110.

SB 726 (Files) – An Act to Promote Fair and Equitable Allocation of Liability in Construction Contracts; and for Other Purposes. **NEUTRAL** SB 726 is now Act 1120.

SB 754 (Hester) – An Act to Amend the Law Concerning the Training and Licensure of Electricians; and for Other Purposes. **SUPPORT** SB 754 is now Act 1122.

Bills We Had a Hand In:

HB 1111 (Sabin) – An Act to Create the Partnership for Public Facilities and Infrastructure Act; to Regulate Public-Private Partnerships for Public Facilities and Infrastructure; and for Other Purposes. Amended 3/19/15. **SUPPORT** Died; not heard on the House floor.

HB 1158 (Womack) – An Act to Amend Arkansas Law Concerning the Right to Engage in a Lawful Occupation; to Stimulate Job Creation and Economic Development While Preserving Health and Safety Standards; and for Other Purposes. Amended on 2/3/15 and 2/11/15. Received a Do Pass by the Committee on 2/12/15. **OPPOSE** Died; not heard on the House floor.

SB 540 (Files) – An Act to Regulate Procurements for Water, Wastewater, and Storm Water Drainage Projects; and for Other Purposes. Failed to Pass the Senate Floor on 3/17/15 – Vote Expunged on 3/18/15 – Passed Senate Floor on 3/25/15 – Sent to House City, County & Local Affairs Committee. **OPPOSE** – Died in House Committee.

SB 221 (Files) – An Act Authorizing Counties to Purchase Excess, Surplus, or Unused Bridge Steel or Materials from the General Contractor of Certain Public Works Projects; and for Other Purposes. SB 221 is now Act 323.

HB 1346 (D. Douglas) – An Act to Provide for the Distribution of Certain Tax Revenues; to Provide Funding for the Arkansas State Highway and Transportation Department, The State Highway Commission, and Related Programs; to Dedicate Certain Revenues for Use by the Arkansas State Highway and Transportation Department and the State Highway Commission; to Dedicate the Sales and Use Tax Revenue Derived from the Sales of New and Used Vehicles and Road-User Items and Services for the Maintenance, Construction, and Reconstruction of Highways, Roads, Streets, Bridges, and Their Extensions Located Within the State; to Dedicate Certain Severance Tax Revenues to Institutions of Higher Education; to Dedicate Certain Severance Tax Revenues for a Workforce Training Grant Program to be Administered by the Department of Career Education; to Declare an Emergency; and for Other Purposes. **SUPPORT** - Withdrawn by author. (House Public Transportation Committee)

management ultimately died, legislation addressing retainage levels, legal venues, indemnification and the licensing of electricians all were approved and signed by the Governor. This proactive approach by our lobbying team and our volunteers at the Capitol was noticed by many legislators and only enhances the already stellar image we have with state legislators.

Lastly, workforce champion Sen. Jane English worked tirelessly in getting her package of reform legislation approved and it should help shape the future of the construction industry employment pool. Sen. English's three bills will restructure how career and technical education and training is governed and, more importantly, delivered across the state and she has pledged repeatedly to always have a seat labeled "Construction" at her table.

Perhaps the most-drawn out and

"We continue to have the best group of volunteer leaders at the state Capitol."

involved battle of the session was around HB 1158 which, according to its title, was concerning "the Right to Engage in a Lawful Occupation" and "to Stimulate Job Creation and Economic Development While Preserving Health and Safety Standards". In essence, this bill would have wiped out any licensure requirements for any occupation in the state from construction professionals to lawyers, from pest controllers to account-

ants. As a businessman, I join most everyone in saying there is too much regulation in the workplace, but this approach of throwing out the baby with the bathwater is not the right way to tackle the problem. We don't think just anyone who carries a pipe wrench should be able to call himself a plumber any more than a guy who has a pocketknife can call himself a heart surgeon. A broad coalition of Arkansas trade associations agreed and banded together to kill this bill in the House of Representatives.

We will continue to watch and listen during the interim for issues that will inevitably arise and try to make the best use of this time by continuing to tell the tale of the importance of the construction industry. We continue to have the best group of volunteer leaders at the state Capitol – these things don't happen without your involvement!

Mike Hocutt is the current president of AGC Arkansas. He is also president of Clark Power Corporation of Little Rock. Email Mike at mhocutt@clarkpower.com.

SB 368 (English, et al) – An Act to Create a Comprehensive Statewide Workforce Development System; to rename the State Board of Career Education; to Coordinate Various Workforce Development Programs; to Create a Board to Oversee Career Education and Workforce Development in Arkansas; to Create an Office of Skills Development; to Declare an Emergency; and for Other Purposes. **SUPPORT** SB 368 is now Act 892.

SB 371 (English) – An Act to Allow a School District to Partner with a State-Supported Institution of Higher Education to Provide Concurrent or Technical Education Options for Students in Alternative Learning Environments; to Allow School Districts to Use National School Lunch Student State or State Categorical Funds for Concurrent Courses or Other Technical Education Academic Learning Opportunities; and for Other Purposes. **SUPPORT** SB 371 is now Act 994.

SB 891 (English) – An Act to establish the Workforce Initiative Act of 2015; Authorizes General Funding Planning Grants to be Established Through Cooperation and Input from Private Sector Industry Segments and Education and Delivery Systems; and for Other Purposes. **SUPPORT** SB 891 is now Act 1131.



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June 24	<i>Membership Luncheon</i>
July 17	<i>MidYear Golf Tournament & Dinner</i>
July 18	<i>MidYear Board Meeting</i>
Nov. 5	<i>Annual Meeting</i>



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By the Numbers

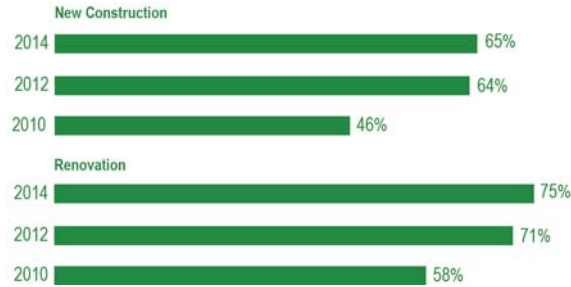
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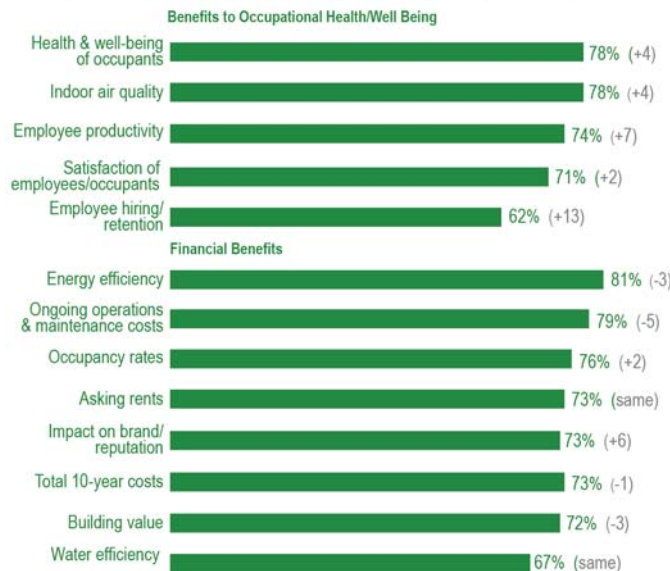
Likelihood to Undertake New Construction or Renovation over Next 12 Months
Percentage Extremely or Very Likely

1



2

Importance when Evaluating Health & Financial Benefits of Green Features
Percentage Extremely or Very Important in 2014 (+/- Percentage Change from 2012)



Turner Construction completed its sixth edition in their Green Building Market Barometer Series. More than 300 executives from organizations that own or rent space, or that design or construction buildings were surveyed. See previous versions of the report at www.turnerconstruction.com/about-us/sustainability/green-market-barometer.

Reflecting a more positive business outlook, 65% of these executives said it was extremely or very likely that their organization would undertake a new construction project over the next 12 months (chart 1) and 75% said the same about undertaking a renovation project.

Take a look (chart 2) at the impact of sustainable efforts on employee health and satisfaction and financial benefits.

The percentage of executives that expected their organizations to use Green materials (chart 3) has increased to 65%, up from 53% in 2012. Changes in state and federal requirements and increased awareness of weather event preparedness are reflected in the areas valued in sustainable projects (chart 4).



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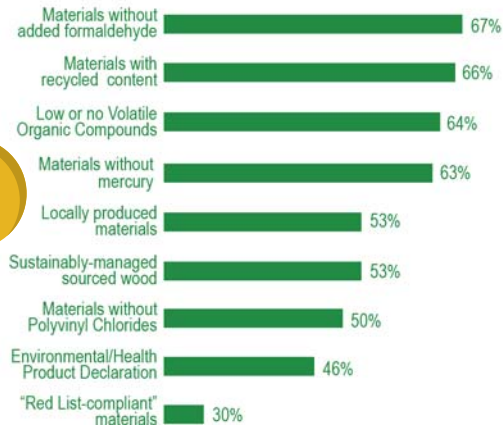
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Green Materials to be Used in New Construction or Renovation Projects

Percentage Extremely/Very Likely, Somewhat Likely, Not/Not Too Likely

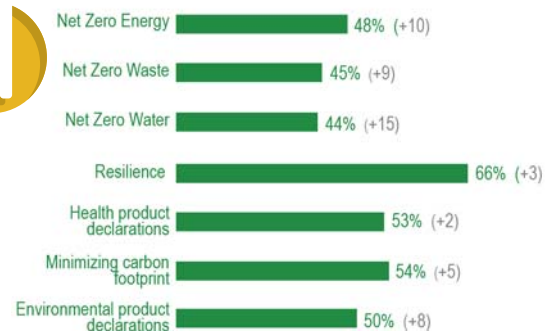
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4

Importance of Factors in Designing, Constructing, and Operating Buildings

Percentage Extremely or Very Important in 2014 (+/- Expected Change in Importance in Three Years)



27

Greenroads

recently reported that more than 60 registered Greenroads Projects are pursuing Certification around the world, valued at more than \$6.7 billion (USD). To date, Greenroads has certified 29.8 centerline miles, 47.5 miles with bicycle access and 10.9 miles of sidewalks.



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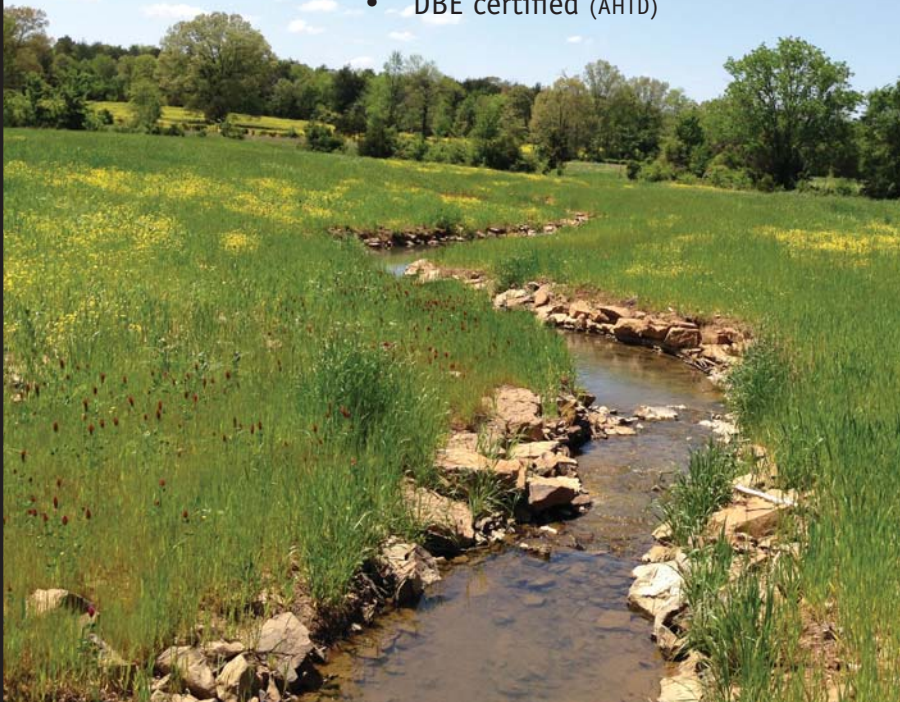
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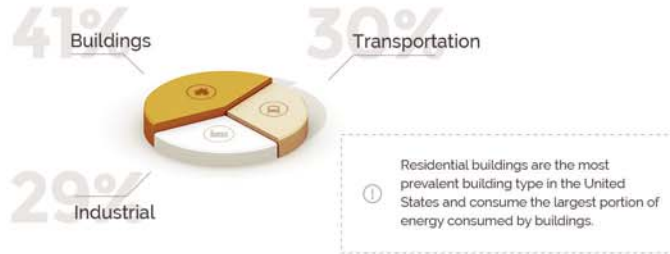
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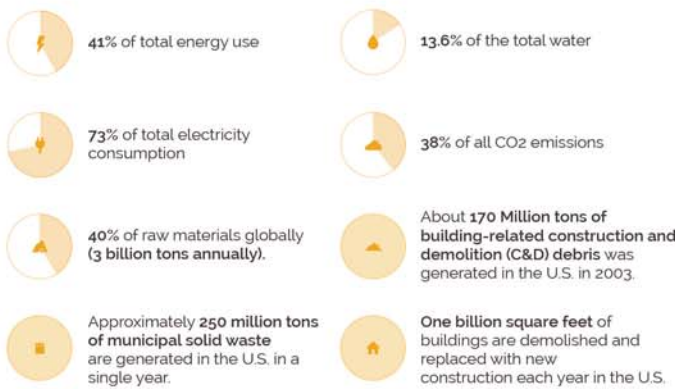
In 2006, the operating energy of residential and commercial buildings in the U.S. constituted roughly 39% of total energy consumed nationwide, about 39 quadrillion BTU – roughly the equivalent of



Energy Use By Sector



U.S. Buildings Account For:



Reinventing U.S. Construction Through LEED

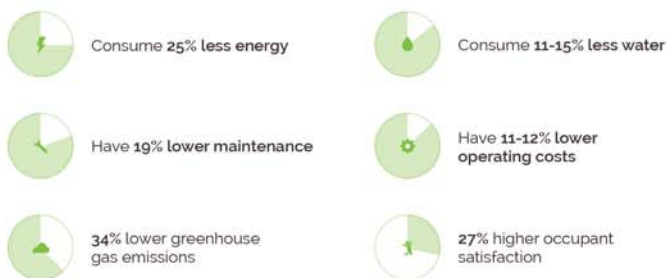
Leadership in Energy and Environmental Design (LEED) is a rating system developed by the U.S. Green Building Council (USGBC) to assess the environmental impact of green buildings throughout their life-cycle - from design and construction, to maintenance, renovation and demolition. Globally, LEED is the most popular and widely used green building rating system.



LEED assessment is based on:



Compared to an average commercial building, LEED Gold buildings currently:



FUTURE LEADERS DIVISION

Under 40 and looking for a way to advance your career? Look no further! Join the AGC Future Leaders Division (FLD). FLD is a great way to network, advance your education and support your industry all while having a great time.

FLD sponsors events like the Sporting Clays Shoot, Baggo Tournament and industry tours. We also take time to give back like in our "Build It Lab" at the Museum of Discovery, a new pump project at First Tee Arkansas and by supporting the AGC Student Chapter at UALR. **Contact btyler@agcar.net to get involved today!**

Comings & Goings

30



Curtis



Fullen



Johns



Lansden



Parker



Strother



Washington



Welch

Job Changes

Baldwin & Shell Construction Company has promoted **Tony Curtis** to vice president of the Central Arkansas Division. Curtis has been in the construction industry for 27 years and is accomplished in everything from project management to electrical design. Previously a senior-level project manager, Curtis will now oversee all construction operation for the Division. **Joe Lansden** has been promoted from senior project manager to vice president of the Construction Services Division. Lansden has 33 years of construction experience including project management, field superintendent and small business owner. In his new position he will oversee all of the construction operations performed by his Division. He has a degree in engineering technology and construction from the University of Arkansas at Little Rock. Lansden was also appointed by the Governor to the Home Inspection Registration Board for three consecutive years.

Clay Johns recently received a promotion to superintendent. Previously, Johns was assistant superintendent. He has been with the company for 19 years and spent 7 of those as a steel and metal building erector in the Metal Building Division. Johns is a certified welder. **Mica Strother** has been hired as vice president of marketing and business development. In this position, she will implement a new sales and marketing program that will help position Baldwin & Shell as they expand the full-service construction company into new markets.

Lance Wright, of **Nabholz Construction Services**, has been promoted to Senior Precon Specialist.

Darragh Company is pleased to announce the appointment of **Scott Trammel** as Director of Retail Operations. As part of this appointment, Trammel will lead Darragh Company and Tool Central in the overall strategy for products related to Retail Sales, the customer segments of Mechanical, Electrical, Plumbing and Interior Contracting. He will also help to develop strategies to identify new opportunities as it relates to growth within these segments.

Nabholz Corporation announces the promotion of **Paul Jones** from Preconstruction Specialist to Manager for the company's Olive Branch, MS construction services operation. In his new role, Jones will be responsible for safety, client satisfaction, project quality, cost control, schedule adherence, and guiding his department in working as a team with all personnel in the company's construction services operation in the Memphis area.

McGeorge Contracting Co., Inc. announces the hiring of **Michael Welch** as Estimator. **James Washington** has completed his Foreman in Training and will become a Foreman in June. **Matt Taylor** and **Shannon Williams** have started the Foreman in Training Process.

Stribling Equipment LLC is proud to announce that **Ryan Parker** has joined their sales team at the Little Rock office. Ryan brings 8 years of experience in the local construction industry and will be focused on the Central Arkansas area.

Becca Fullen has joined **Southern Branding** as Web Coordinator.

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Company News

AGC Arkansas funded the UALR TEXO/ASC Student Competition Teams. The Highway Division has been funding the Heavy Civil team for more than 10 years and did so again this year. This is the first year that the Building Division sponsored the Commercial team. UALR expresses immense gratitude for support of their students and program. The following is the list of students in the competition as coached by Mike Tramel:

**Anna Friemel
Essie Whitmore
Gaylon Kilcrease
Jonathan Clem
Matthew Rima
Shawn Moix
Edward Holcomb - Alternate
Cerise Inganji - Observer**

All of the seniors in UALR's Civil and Construction Engineering Program passed the American Institute of Constructors (AIC) Associate Constructor (AC) exam on their first attempt. This is the first time that the entire senior class in the civil and construction engineering program has passed the AC exam on each student's first attempt. The AC exam is eight-hours long, and is administered nationwide only twice per year. With 378 students out of 788 passing nationwide, the national pass rate on the March 2015 administration was 48%.

This year's AC exam results indicate that the UALR students scored above the national average in all ten areas. Shawn Moix passed all ten areas and Andrew Yarberry had the highest score (both are construction management students).

Immediately after graduation, these students will be eligible to apply for AIC's Associate Constructor certification, which will identify them as constructors who "bring value to any project as they have a verified skill and knowledge level that is based on a nearly 20 year old body of knowledge that continues to be refined," as stated on the AIC website.

John Brown University Construction Management Students competed in the Associated Schools of Construction (ASC)/TEXO Student Contracting Competition. This year JBU had teams in three categories - Commercial, Heavy Civil, and Design Build. The Heavy Civil team won first place in their category and the other two teams competed well.

John Brown University Construction Management Students sponsored by David Ellingson, Assistant Professor - CPC, LEED-AP, won first place in the Ethics Competition sponsored by the American Institute of Constructors (AIC). The AIC Ethics Competition was created to showcase the ethical prowess of the best and brightest university students. The competition is held during AIC's Annual Forum.

Danny Wright of Diamond Construction has been appointed for the fifth time, and by the third governor, to the Arkansas Contractors Licensing

Board. Wright has served as an Advisory Board member of the Arkansas One Call Board since 2006. In April, he was named a full voting member of the board, representing AGC Arkansas and excavator users.

AGC Arkansas was presented with the 2015 Sponsorship Award from the UALR Construction Management and Civil and Construction Engineering Program in recognition of sponsoring the AGC Future Leaders Division Internship Meet and Greet. The event was a huge success with nearly

100 students and more than 20 AGC companies participating.

John Davis, president of First Security Bank in North Little Rock, has been elected to the CareLink board of directors. Courtney Little, president and general counsel of ACE Glass, has been named chair-elect.

Dan Williams, CEO of Garver, has been named a board member of the Arkansas Research Alliance.



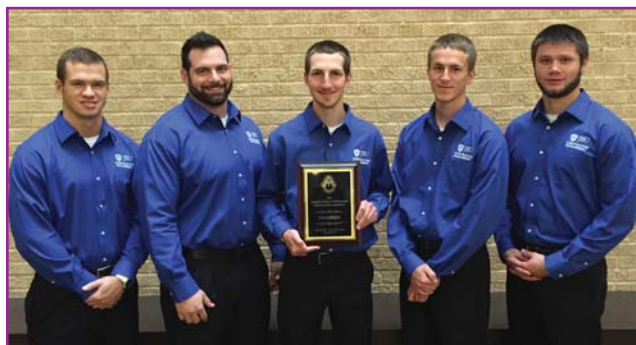
The JBU Heavy Civil Team earned first place at the TEXO/ASC Student Competition.



Professor Mike Tramel and the UALR TEXO/ASC Student Competition Team.



JBU TEXO/ASC student competitors.



JBU Construction Management students won the AIC Ethics Competition.

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AGC Contact: Mike Malone

mike@malonesmechanical.com

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